

**Geneva Wood Fuels, LLC
Franklin County
Strong, Maine
A-342-71-P-T/A (SM)**

**Departmental
Findings of Fact and Order
Air Emission License
Amendment #2**

After review of the air emissions license amendment and transfer applications, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A., §344 and §590, the Department finds the following facts:

I. REGISTRATION

A. Introduction

Geneva Wood Fuels, LLC (Geneva Wood Fuels) has submitted a transfer application and an amendment application for the proposed wood pellet manufacturing facility in Strong, Maine. The transfer application is for transfer of facility ownership from Geneva Energy Maine, LLC to Geneva Wood Fuels, LLC. The amendment application is for a rotary wood chip dryer to replace the licensed bed wood chip dryer which was never installed. The facility also includes a licensed wood boiler.

B. Transfer

Geneva Wood Fuels has requested the transfer of Air Emission License A-342-71-M-N and amendment A-342-71-N-M from Geneva Energy Maine, LLC to Geneva Wood Fuels, LLC.

Title, Right, or Interest

In their application, Geneva Wood Fuels submitted copies of property deeds transferring ownership of the facility. The parties have provided sufficient evidence of title, right, or interest in the facility to allow the transfer of the facility's licenses.

Financial Capacity and Intent

Geneva Wood Fuels stated that they possess the financial capacity to operate the facility in compliance with its air emission license.

Technical Capacity and Intent

Geneva Wood Fuels stated that they have the technical capacity to operate the facility and intend to comply with all conditions of the applicable air emission license and amendments, and will satisfy all applicable statutory criteria.

Full Name and Address

The full name and address of the new owner is:

Geneva Wood Fuels, LLC
2248 North Burling
Chicago, IL 60614

Certification

Geneva Wood Fuels certifies that there will be no increase in air emissions beyond that provided for in the existing licenses, either in quantity or type without prior written permission from the Department.

C. Emission Equipment

The following equipment is addressed in this air emission license amendment:

Fuel Burning Equipment

<u>Equipment</u>	<u>Maximum Capacity (MMBtu/hr)</u>	<u>Maximum Firing Rate (lb/hr)</u>	<u>Fuel Type</u>	<u>Pollution Control Equipment</u>	<u>Stack #</u>
Boiler 1 <i>existing</i>	33.7	9361 (3600 Btu/lb wet wood/bark)	wood	multiclone	1
Wood Burner on Dryer 1 <i>new</i>	40	4665 (10% moisture)	Wood	multiclone	2

Process Equipment

<u>Equipment</u>	<u>Max. Raw Material Process Rate</u>	<u>Max. Finished Material Process Rate</u>
Dryer 1 <i>replaces previously proposed Dryer 1</i>	56,724 lb/hr green wood 45% moisture	34,665 lb/hr Dry wood 10% moisture

D. Application Classification

The transfer application (A-342-71-O-T) and the amendment application (A-342-71-P-A) will be processed and issued as one amendment, A-342-71-P-T/A.

The modification of a minor source is considered a major modification based on whether or not expected emission increases exceed the “Significant Emission Levels” as defined in the *Definitions Regulation*, 06-096 CMR 100 (last amended December 24, 2005). The emission increases are determined by subtracting the current licensed emissions preceding the modification from the maximum future licensed allowed emissions, as follows:

<u>Pollutant</u>	<u>Current License (TPY)</u>	<u>Future License (TPY)</u>	<u>Net Change (TPY)</u>	<u>Sig. Level</u>
PM	24.2	56.0	+31.8	100
PM ₁₀	24.2	24.5	+0.3	100
SO ₂	3.0	9.4	+6.4	100
NO _x	22.7	38.5	+15.8	100
CO	76.5	75.5	-1.0	100
VOC	49.9	47.3	-2.6	50

This modification is determined to be a minor modification and the application has been processed as such through *Major and Minor Source Air Emission License Regulations*, 06-096 CMR 115 (last amended December 24, 2005). With the annual fuel limit on the boiler and the total annual operating limit on the dryer, the facility is licensed below the major source thresholds and is considered a synthetic minor source.

II. BEST PRACTICAL TREATMENT (BPT)

A. Introduction

In order to receive a license the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in 06-096 CMR 100. Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in 06-096

CMR 100. BACT is a top-down approach to selecting air emission controls considering economic, environmental and energy impacts.

Process Description

The Geneva Wood Fuel facility will receive wood residues and wood chips by trailer truck. The wood will be transferred to the production portion of the building and stored in an outdoor silo. The green wood will then be transferred from the silo to the wood feeder. Green wood will be fed into a 700 cubic foot live bottom self feeder that controls the feed rate through the system. The self feeder will drop the material into a hog for pre-grinding and then continue onto a drag conveyor and up into a screw conveyor. The screw conveyor will transfer the material into the rotary drum dryer.

Once in the rotary drum dryer, the green wood will be dried to approximately 10% moisture content by heat supplied by the burner. The burner shall fire clean, dry wood fines that are generated from the pellet manufacturing process. After exiting the dryer, the exhaust gas and dried wood fines will be conveyed to four process cyclones operating in parallel. The exhaust gas shall recombine into an exhaust manifold before exiting the stack.

A dryer air fan will pull the air through the dryer, collectors, and out through the dryer exhaust stack. The collected dried wood will be reduced in size by the dry hammermill. The dry hammermill will have a cyclone collector and air system for collecting the wood fines. The fines will drop into the system drag conveyor and will be pneumatically conveyed to the dry wood storage and metering bin. The air from the fan discharge will return to the burner hot gas manifold and be re-used through the dryer system.

The dry wood will be metered to the pelletizer. The pellets will be formed through extrusion which results in heat and evaporation of moisture. Once the pellets are produced, they will be vacuumed from the pelletizer and go through a tumbler and screening process to remove fines and sharp edges. The fines will be returned to the pelletizer infeed. Process cyclones control particulate matter from the pelletizer. The finished pellets will be conveyed to storage silos.

The pellets will then be conveyed to the 'form, fill, and seal' automatic bagging system. The automatic bagging system will unitize the 40 pound bags and wrap them in one ton units on pallets. The pallets will be loaded onto trucks by forklift at the loading dock.

B. Boiler #1

Boiler #1, manufactured in 1980 with a maximum capacity of 33.7 MMBtu/hr burning wood waste, was licensed in air emission license A-342-71-M-N. The requirements of that license shall continue to apply, except for a revision to the annual fuel use.

This amendment limits the annual boiler fuel use to 15,754 tons wood/year based on 3600 Btu/lb (or equivalent), on a 12 month rolling total. Compliance with the annual fuel use limit shall be recorded daily in a fuel use log, based on bucket loads of fuel.

C. Dryer #1

Dryer #1 is proposed to be installed in place of the previously licensed bed dryer which was never installed. Dryer #1 is a rotary dryer and burner system. The wood-fired burner is rated at 40 MMBtu/hr and the capacity of the rotary dryer is drying a maximum of 15.6 oven-dried tons (ODT) of wood an hour.

The wood fired burner will combust dry wood fines generated from the pellet manufacturing process. No additional fuel is needed since start-ups are manual. The combustion gases from the burner will be mixed with ambient air then vented directly into the dryer. The cyclonic burner is designed to limit NO_x and CO formation by providing staged combustion, 200% excess air and maintaining combustion temperatures at or around 1800°F. The dryer inlet temperature will be maintained at around 800°F.

The rotary dryer will be approximately 12 feet in diameter and 50 feet long and will have eight internal serpentine zones. The green wood will be dried to approximately 10% moisture content by heat supplied by the burner. The exhaust gases will be conveyed to the four process cyclones, operating in parallel to separate the exhaust gas from the wood fines. The exhaust will recombine into a single 50 foot exhaust stack.

Geneva Wood Fuels submitted a BACT analysis for the proposed dryer, as summarized below:

PM/PM₁₀ - Particulate matter control devices include multicyclones, wet scrubbers, electrified gravel bed filters, electrostatic precipitators (ESP) and fabric filters. For Geneva Wood Fuels, the use of multicyclones are integral to the process for separating the product from the air stream. The addition of fabric filters after the multicyclones is not technically feasible because of the potential fire safety hazard. ESPs, wet scrubbers, and

electrified bed filters are not economically feasible for the size of this dryer and the estimated emissions. Geneva Wood Fuels performed a search of EPA's RACT/BACT/LAER Clearinghouse and no recently permitted pellet plants had particulate control requirements in addition to cyclones.

Geneva Wood Fuels has proposed BACT for the control of PM and PM₁₀ to be four cyclones in parallel with a vendor guarantee of 99.97% collection of the total dry flow. PM emissions from this high efficiency multicyclone system is proposed to be 10.4 lb/hr for PM and 2.0 lb/hr for PM₁₀.

SO₂– Sulfur dioxide control methods include the addition of a dry reagent into the dryer or onto the fuel at the burner and the use of a scrubber. The combustion of wood fuel in the dryer burner will result in low levels of sulfur due to the small amount of naturally occurring sulfur in the fuel. Add-on SO₂ removal technologies would not be cost effective nor would they result in significant environmental benefit.

Geneva Wood Fuels has proposed BACT for SO₂ to be the use of clean wood residues and wood chips. Assuming a maximum fuel sulfur content of 0.02% by weight, SO₂ emissions will be limited to 1.88 lb/hr, based on 0.047 lb/MMBtu.

NO_x- Nitrogen oxide is formed during combustion: thermal NO_x when nitrogen and oxygen react due to high combustion temperatures and fuel NO_x when fuel nitrogen is oxidized during combustion. Wood is assumed to have small amounts of nitrogen (approximately 0.55%). To control thermal NO_x, combustion controls include minimizing air at the burner and providing overfire air, and post combustion controls include selective non-catalytic reduction (SNCR) and selective catalytic reduction (SCR). For the dryer at Geneva Wood Fuels, SNCR is not considered economically feasible and may adversely effect the environment with the required ammonia injection. SCR is not considered technically feasible because of the high particulate loading from wood firing and is not economically feasible due to the high capital cost.

Geneva Wood Fuels has proposed BACT for NO_x to be good combustion practices and a NO_x limit of 5.73 lb/hr, based on 0.367 lb/oven-dried ton. The wood burner is considered a low NO_x burner since the combustion temperature is maintained at or around 1800°F. There is also staged combustion where the fuel is mixed with conveying air for the 'first stage'

entry of the fuel in the chamber and then is mixed in vertical stages with the rest of the combustion gases.

CO - Carbon monoxide control methods include an oxidation catalyst. CO emissions can also be controlled through optimizing oxygen levels, combustion temperature, turbulence, and residence time. A potential technical feasibility issue with an oxidation catalyst is the possible plugging and fouling of the catalyst material from the constituents of wood boiler exhaust.

Geneva Wood Fuels has proposed BACT for CO to be good combustion practices. 200% excess air will be used to limit the formation of CO from the refractory-lined cyclonic suspension burner. A CO limit was originally proposed (19.8 lb/hr), then it was revised by Geneva Wood Fuel to a lower 1.81 lb/hr, based on the emission factor from the manufacturer. However, based on wood burner emission experiences of other sources, the MEDEP finds BACT for this dryer to be 5.0 lb/hr of CO.

VOC – Volatile Organic Compounds can be controlled through process temperature. VOCs are found naturally occurring in wood.

Geneva Wood Fuels has proposed BACT for VOC to be low temperatures within the dryer to limit VOC formation and a VOC limit of 11.7 lb/hr, based on 0.75 lb/oven-dried ton.

Opacity – Opacity from the dryer stack shall be limited to no more than 20% opacity on a 6-minute block average basis, except for no more than one (1) six (6) minute block average in a 1-hour period, based on 06-096 CMR 101.

Geneva Wood Fuels shall limit the dryer to 7500 hours of operation/year. An hour meter shall be installed on the dryer and operating records shall be kept on a daily, monthly, and 12 month rolling total. Wood fuel use records shall also be kept for the dryer burner on a daily, monthly, and 12 month rolling total. Geneva Wood Fuels shall keep records on the amount of product output on a monthly basis.

Geneva Wood Fuels shall install and operate a temperature probe system on the dryer. The temperature probe system shall document temperature in the combustion chamber for operational and pollution control purposes.

Geneva Wood Fuels shall perform stack tests on the dryer for PM, PM₁₀, CO and VOC within six months of start-up.

D. Pelletizer, Bagging and Shipping, General Process Emissions, and Fugitive Emissions

The requirements for the pelletizer, bagging and shipping, general process emissions, and fugitive emissions shall remain as licensed in air emission license A-342-71-M-N.

E. Annual Emissions

Geneva Wood Fuel shall be limited to the following annual emissions, based on a 12 month rolling total, and calculated from an annual boiler fuel limit of 15,754 tons/year wood waste (55% moisture or equivalent) and an annual operating limit on the dryer of 7500 hours/year:

Total Licensed Annual Emissions for the Facility
Tons/year
(used to calculate the annual license fee)

	PM	PM₁₀	SO₂	NO_x	CO	VOC
Boiler	17.0	17.0	2.3	17.0	56.7	3.4
Dryer	39.0	7.5	7.1	21.5	18.8	43.9
Total TPY	56.0	24.5	9.4	38.5	75.5	47.3

III.AMBIENT AIR QUALITY ANALYSIS

According to 06-096 CMR 115, the level of air quality analyses required for a minor source shall be determined on a case-by case basis. Modeling and monitoring are required if the total emissions of any pollutant released meet or exceed the following:

<u>Pollutant</u>	<u>Tons/Year</u>
PM ₁₀	25
SO ₂	50
NO _x	100
CO	250

Based on the information available in the file, and the similarity to existing sources, and the license tons/year limits, Maine Ambient Air Quality Standards (MAAQS) will not be violated by this source.

ORDER

The Department concludes that the applicant for the air emission license transfer has the capacity to satisfy all applicable statutory criteria and hereby APPROVES the transfer of Air Emission License A-342-71-M-N and amendment A-342-71-N-M, from Geneva Energy Maine, LLC to Geneva Wood Fuels, LLC subject to all conditions attached to them.

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards,
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License Amendment A-342-71-P-T/A subject to the conditions in Air Emission License A-342-71-M-N, amendment A-342-71-N-M, and in the following conditions.

SPECIFIC CONDITIONS

The following shall replace condition (16) in air emission license A-342-71-M-N:

(16) Boiler #1 (33.7 MMBtu/hr – wood fired)

A. Emissions from Boiler #1 shall not exceed the following:

Pollutant	lb/MMBtu	Origin and Authority
PM	0.3	06-096 CMR 103(2)(B)(4)(a)
PM ₁₀	0.3	06-096 CMR 103(2)(B)(4)(a)
NO _x	0.3	06-096 CMR 115, BACT

- B. Emissions from Boiler #1 shall not exceed the following [06-096 CMR 115, BACT]:

PM (lb/hr)	PM₁₀ (lb/hr)	SO₂ (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
10.1	10.1	1.4	10.1	33.7	2.0

- C. Visible emissions from Boiler #1 shall not exceed 30% opacity on a six (6) minute block average, except for no more than two (2) six (6) minute block averages in a continuous 3-hour period. [06-096 CMR 101]
- D. Fuel use in the boiler shall not exceed 15,754 tons/yr wood waste (3600 Btu/lb, 55% moisture), or equivalent. Compliance with the annual boiler fuel use limit shall be recorded daily in a fuel use log, based on bucket loads of fuel. The log shall include the estimation of the amount of fuel in a bucket load. Fuel use records shall be maintained on a daily, monthly, and 12 month rolling total. [06-096 CMR 115, BACT]
- E. Geneva Wood Fuels may mix specification waste oil with the wood waste residue fired in the wood fired boiler. The specification waste oil use shall not exceed 60 gallons/month. Records shall be maintained documenting the gallons of specification waste oil fired each month.

Geneva Wood Fuels may mix oily rags with the wood waste residue fired in the wood fired boiler. The oily rags must originate from the facility and the permeated oil must meet the requirements of specification waste oil. Geneva Wood Fuels shall maintain records of the amount of oily rags burned each month (ie – a full 55 gallon drum, ½ drum, etc).

An analysis of a representative waste oil sample shall be kept on site. If there are changes in the process or if there are changes in the maintenance garage that may effect the composition of the waste oil collected, a new representative sample shall be tested. These test results shall be kept on-site and a copy shall be submitted to the Bureau of Air Quality.

[06-096 CMR 115, BACT and 06-096 CMR 860]

The following shall replace condition (17) in air emission license A-342-71-M-N, as amended in amendment #1, A-342-71-N-M:

(17) Dryer #1

- A. Emissions from the Dryer Process (including the 40 MMBtu/hr wood dryer burner) shall not exceed the following: [06-096 CMR 115, BACT]

PM (lb/hr)	PM₁₀ (lb/hr)	SO₂ (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
10.4	2.01	1.88	5.73	5.0	11.7

- B. Visible emissions from the dryer stack shall not exceed 20% opacity on a 6-minute block average basis, except for no more than one (1) six (6) minute block average in a 1-hour period. [06-096 CMR 101]
- C. The inlet temperature of the rotary dryer shall be monitored on a continuous basis for a minimum of 95% of the time the rotary dryer is operating, except during periods of startup, shutdown, or malfunction. The inlet temperature of the rotary dryer shall be recorded at least once per shift. The date and time of each temperature reading shall also be recorded. The temperature monitoring system shall be installed, operated, maintained, and calibrated in accordance with the manufacturer's recommendations. [06-096 CMR 115, BACT]
- D. Geneva Wood Fuels shall limit the dryer use to 7500 hours/year. An hour meter shall be installed and operated on the dryer and records shall be maintained daily, monthly, and on a 12 month rolling total. [06-096 CMR 115, BACT]
- E. Geneva Wood Fuels shall maintain wood fuel records for the dryer burner on a daily, monthly, and 12 month rolling total. [06-096 CMR 115, BACT]
- F. Geneva Wood Fuels shall keep records on the amount of product output on a monthly basis. [06-096 CMR 115, BACT]
- G. Geneva Wood Fuels shall keep maintenance records on the multicyclone system. [06-096 CMR 115, BACT]
- H. Geneva Wood Fuels shall record each startup, shutdown, and malfunction event including start time, end time, duration, cause, and method utilized to minimize the duration of the event and/or to prevent a reoccurrence. [06-096 CMR 115]

**Geneva Wood Fuels, LLC
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Strong, Maine
A-342-71-P-T/A (SM)**

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**Departmental
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The following shall replace condition (18) in air emission license A-342-71-M-N:

(18) Stack Testing

Within six months of start-up, Geneva Wood Fuels shall perform PM, PM₁₀, CO, and VOC stack tests on Dryer #1 in accordance with the appropriate EPA test methods. [06-096 CMR 115, BACT]

DONE AND DATED IN AUGUSTA, MAINE THIS DAY OF , 2008

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: _____
DAVID P. LITTELL, COMMISSIONER

The term of this license shall be concurrent with Air Emission License A-342-71-M-N.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: June 2, 2008

Date of application acceptance: June 3, 2008

Date filed with the Board of Environmental Protection: _____

This Order prepared by Kathleen E. Tarbuck, Bureau of Air Quality.